**Amendments to the Claims:**

This listing will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Currently amended): A method of generating electricity which comprises:

a) providing a reactor which comprises:

~~reactor comprises:~~

a heat reservoir at an upstream side;

a cold reservoir at a downstream side;

a connecting pipe connected between the heat reservoir and the cold reservoir;

a gas inlet at the upstream side;

a gas outlet at the downstream side;

means for flowing a stream of gas containing water through the reactor from the upstream side to the downstream side;

means for heating the gas stream flowing through said reactor at a sufficient rate to cause non-equilibrium reactions to occur in the reactor so that components of said stream of gas to undergo nuclear reactions and produce free electrons; and

a magnet and a conductive collector for collecting and removing freed electrons

from the reactor.

b) providing a gas stream that contains water as a source of hydrogen atoms;

c) flowing the gas stream through the reactor using the means for flowing;

d) using the means for heating to heat the gas stream at a rapid rate sufficient to:

i) produce hydrogen atoms from the water;

ii) transform the produced hydrogen atoms into protons and free electrons; and

iii) induce a sustained chain reaction, including nuclear reactions; and

e) using the magnet and conductive conductor to collect the free electrons as a source of electricity.

Claim 2 (Original): A method of generating electricity according to claim 1, further comprising:

terminating the application of heat to the gas stream after the sustained chain reaction, including nuclear reactions are induced; and

allowing the sustained chain reaction, including nuclear reactions to continue in reactive species of the gas stream.

Claim 3 (Original): A method of generating electricity according to claim 1, wherein the nuclear reactions include nuclear fusion.

Claim 4 (Original): A method of generating electricity according to claim 1, wherein the gas

stream comprises one of air and a flue gas.

Claim 5 (Original): A method of generating electricity according to claim 1, wherein the rapid heating performed in step a) is performed by using at least one of a flame generator, a laser beam, an electric arc and a microwave generator.

Claim 6 (Original): A method of generating electricity according to claim 1, further comprising the step of adding a chemical reactant species into the gas stream prior to applying heat to the gas stream and collecting a chemical reaction product produced from the added chemical reactant species.

Claim 7 (Original): A method of generating electricity according to claim 1, further comprising recovering heat produced from the sustained chain reaction.

Claim 8 (Original): A method of generating electricity according to claim 1, wherein the method further comprises reacting the collected free electrons with the protons away from an area where the chain reaction occurs.

Claim 9 (Previously presented): A method of generating electricity according to claim 8 further comprises rapidly cooling the gas stream in the cold reservoir to facilitate reacting the collected

free electrons with the protons to form hydrogen.

Claim 10 (Previously presented): A nuclear reactor that produces electricity, which nuclear reactor comprises:

a heat reservoir at an upstream side;

a cold reservoir at a downstream side;

a connecting pipe connected between the heat reservoir and the cold reservoir;

a gas inlet at the upstream side;

a gas outlet at the downstream side;

a source of gas containing water;

means for flowing a stream of the gas containing water through the reactor from the upstream side to the downstream side;

means for heating the gas stream flowing through said reactor at a sufficient rate to cause non-equilibrium reactions to occur in the reactor so that components of said stream of gas to undergo nuclear reactions and produce free electrons; and

a magnet and a conductive collector for collecting and removing freed electrons from the reactor.

Claim 11 (Original): A nuclear reactor that produces electricity according to claim 10, wherein the means for heating the gas stream flowing through said reactor comprises a first co-current

means for heating the gas stream and a second countercurrent means for heating the gas stream with the first means for heating the gas stream being upstream of the second means for heating the gas stream.

Claim 12 (Original): A nuclear reactor that produces electricity according to claim 10, further including means to re-introduce the removed electrons into a downstream portion of the reactor so that the re-introduced electrons can react with protons to form hydrogen in the cold reservoir.

Claim 13 (Canceled)

Claim 14 (Original): A nuclear reactor that produces electricity according to claim 10, further including a heat exchanger for recovering heat from the reactor, the heat exchanger being located downstream of the heat reservoir.

Claim 15 (Canceled):

Claim 16 (Original): A nuclear reactor that produces electricity according to claim 11, wherein both the first and second means to heat the gas flowing through the reactor comprises flame generators which direct flames toward each other.

Claim 17 (Canceled)

Claim 18 (Original): A nuclear reactor that produces electricity according to claim 10, further comprising means to inject a chemical species for increasing nuclear reaction activities into the stream of gas flowing through the reactor.

Claim 19 (Previously presented): A nuclear fuel cell that comprises:

a reactor having an upstream side and a downstream side;

a gas inlet at the upstream side;

a gas outlet at the downstream side;

means for flowing a stream of gas through the reactor from the upstream side to the downstream side;

means for heating the gas stream flowing through said reactor at a sufficient rate to cause non-equilibrium reactions to occur in the reactor so that components of said stream of gas ~~to~~ undergo nuclear reactions and produce protons and free electrons;

and a cold reservoir at a downstream portion of the reactor for cooling the gas stream so as to recombine electrons and protons to form hydrogen.

Claim 20 (Previously presented): The combination of a nuclear fuel cell according to claim 19, in an internal combustible engine vehicle wherein hydrogen produced by the nuclear fuel cell is

used as a fuel in internal combustible engine.

Claim 21 (Previously presented): A method of generating electricity according to claim 1, wherein the gas stream includes a chemical species and the method further involves rapidly cooling the heated gas stream after step e) in a cold reservoir to effect a change in the chemical species.

Claim 22 (Previously presented): A method of generating electricity according to claim 21, wherein the rapid cooling affects at least one of:

i) decomposition of $NO_x$;

ii) decomposition of $CO_2$; and

iii) decomposition of $SO_x$.

Claim 23 (Previously presented): A method of generating electricity according to claim 6, wherein the chemical reactant comprises limestone and the chemical reaction product comprises lime.

Claim 24 (Previously presented): A method of generating electricity according to claim 1, wherein the gas stream comprises flue gas that contains $H_2S$ which is dissociated into $H_2$ and S in step b).

Claim 25 (Previously presented): A method of generating electricity according to claim 1, wherein fuel oil is added to the gas stream and the fuel oil is transformed into light hydrocarbons in step b).

Claim 26 (Previously presented): A method of generating electricity according to claim 6, wherein the chemical reactant comprises $SO_2$ and water and the chemical reaction product comprises $H_2SO_4$.

Claim 27 (Previously presented): A nuclear reactor that produces electricity according to claim 19, further comprising means to inject coolant into the cold reservoir to initiate the combination of electrons and protons to form hydrogen.

Claim 28 (Previously presented): A method of generating electricity according to claim 26, wherein $SO_2$ is oxidized to $SO_3$ by a high rate of temperature increase due to the nuclear reaction and steam is injected to react with the $SO_3$ to form $H_2SO_4$.

Claim 29 (Previously presented): A method of generating electricity according to claim 28, the temperature of the injected steam is equal or higher to the temperature of the $SO_3$ containing gas flow at point of injection to form $H_2SO_4$ mist in the reactor.

Claim 30 (Previously presented): A method of generating electricity according to claim 29, wherein the $H_2SO_4$ mist is condensed to $H_2SO_4$ liquid to a temperature of about 250°F and collected.

Claim 31 (Previously presented): A nuclear reactor that produces electricity according to claim 10, wherein the cross sectional area of heat reservoir is at least fifteen times that of connecting pipe, the cross sectional area of cold reservoir is equal to that of heat reservoir, and the cross sectional area of connecting pipe is the same as that of an incoming pipe to the reactor.

Claim 32 (Previously presented): A nuclear reactor that produces electricity according to claim 10, further comprising means to recycle a portion of the gas stream flowing through the reactor and means to add water to the recycled gas stream.